MDSC-1119/MDSC-2124

Getting Started Guide

(This page intentionally left blank.)

Copyright notice

This document is copyrighted. All rights are reserved. Neither this document, nor any part of it, may be reproduced or copied in any form or by any means - graphical, electronic, or mechanical including photocopying, taping or information storage and retrieval systems - without written permission of Barco

© 2013 Barco N.V. All rights reserved.

Notice

Although every attempt has been made to achieve technical accuracy in this document, we assume no responsibility for errors that may be found. Our goal is to provide you with the most accurate and usable documentation possible; if you discover errors, please let us know.

Barco software products are the property of Barco. They are distributed under copyright by Barco N.V. or Barco, Inc., for use only under the specific terms of a software license agreement between Barco N.V. or Barco Inc. and the licensee. No other use, duplication, or disclosure of a Barco software product, in any form, is authorized.

The specifications of Barco products are subject to change without notice.

Trademarks

All trademarks and registered trademarks are property of their respective owners.

Table of Contents

Preface 5
FCC compliance information 5
Environmental information 6
Safety Instructions 9
EMC notice 12
Recommendations for using your display system 19
Explanation of symbols 20
Introduction 22
Display parts, controls and connectors 23
Front 23
Rear 25
Connectors 25
Installation precautions 31
Vesa-mount installation 31
Connecting the signal cables 32
Cleaning instructions 35
Precautions 35
Front filter 35
Cabinet 37
Technical information 38
Connector pin assignments 38
Power cable recommendations 42
Technical specifications 43

Preface

FCC compliance information

FCC Compliance Information (display)

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Canadian notice

This ISM device complies with Canadian ICES-001.

Cet appareil ISM est conforme à la norme NMB-001 du Canada.

Environmental information

Disposal Information

This product consists of devices that may contain mercury, which must be recycled or disposed of in accordance with local, state, or country laws. (Within this system, the backlight lamps in the monitor display contain mercury.)

This equipment has required the extraction and use of natural resources for its production. It may contain hazardous substances for health and environment.

In order to avoid the dissemination of those substances in the environment and to diminish the pressure on natural resources, we encourage you to use the appropriate take-back systems.

Those systems will reuse or recycle most of the materials of your end-of-life equipment in a sound way.

The crossed-out wheeled bin symbol invites you to use those systems.

If you need more information on the collection, reuse and recycling systems, please contact your local or regional waste administrator.

You can also contact us for more information on the environmental performances of our products.

Information for China ROHS compliance

Table of toxic and hazardous substances/elements and their content, as required by China's management methods for controlling pollution by electronic information products

	Toxic or hazardous Substances and Elements					
Part Name	**Pb**	**Hg**	**Cd**	**Cr6+**	**PBB**	**PBDE**
Metal parts	O	O	O	O	O	O
Plastic parts	O	O	O	O	O	O
PCB or PCBA	O	O	O	O	O	O
LCD panel	X	X	O	O	O	O
Power supply/adapter	X	O	O	O	O	O
Power cable	X	O	O	O	O	O
Connectors and cables	O	O	O	O	O	O

O: Indicates that this toxic or hazardous substance contained in all of the homogeneous materials for this part is below the limit requirement in SJ/T11363-2006.

X: Indicates that this toxic or hazardous substance contained in at least one of the homogeneous materials used for this part is above the limit requirement in SJ/T11363-2006

中国大陆 RoHS

根据中国大陆《电子信息产品污染控制管理办法》(也称为中国大陆 RoHS)，以下部份列出了本产品中可能包含的有毒有害物质或元素的名称和含量。

本表适用的产品

液晶显示器

有毒有害物质或元素

LCD Monitor						
零部件名稱	有毒有害物質或元素					
	铅（Pb）	汞（Hg）	镉（Cd）	六价铬（Cr6+）	多溴联苯（PBB）	多溴二苯醚（PBDE）
金属机构件	O	O	O	O	O	O
塑料机构件	O	O	O	O	O	O
电路板组件 *	O	O	O	O	O	O
液晶面板	X	X	O	O	O	O
电源模块 / 适配器	X	O	O	O	O	O
电源线	X	O	O	O	O	O
外部信号连接线	O	O	O	O	O	O

*：电路板组件包括印刷电路板及其构成的零部件，如电阻、电容、集成电路、连接器等

○：表示该有毒有害物质在该部件所有均质材料中的含量均在 《电子信息产品中有毒有害物质的限量要求标准》规定的限量要求以下

×：表示该有毒有害物质至少在该部件的某一均质材料中的含量超出 《电子信息产品中有毒有害物质的限量要求标准》规定的限量要求；
但是上表中打 “×” 的部件，其含量超出是因为目前业界还没有成熟的可替代的技术

Safety Instructions

General Recommendations

Read these safety and operating instructions before operating the display.

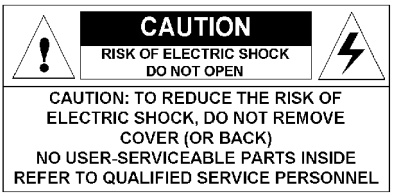
Retain safety and operating instructions for future reference.

Adhere to all warnings on the display and in the manuals.

Follow all instructions for operation and use.

If this equipment is modified, appropriate inspection and testing must be conducted to ensure continued safe use of the equipment.

Electrical shock



Type of protection (electrical):

Class I equipment

Degree of safety (flammable anesthetic mixture):

Equipment not suitable for use in the presence of a flammable anesthetic mixture with air or with oxygen or nitrous oxide.

Non-patient care equipment

Equipment primarily for use in a health care facility that is intended for use where contact with a patient is unlikely.

The display may not be used with life support equipment.

Mission critical applications

We strongly recommend there is a replacement display immediately available in mission critical applications.

Power connection

- Power requirements: The display must be powered using the supplied medical approved 24 VDC power supply.
- The medical approved DC power supply must be powered by the AC mains voltage.
- The display complies to the mentioned standards only when used with the supplied medical power supply.
- The display must be powered from a center-tapped electrical circuit when used in the USA at voltages above 120 Volts.
- The display is intended for continuous operation.
- The display is powered from an external power supply for class I equipment. The installer is responsible for testing the display's earth ground to verify that it meets the impedance requirements for the given country regulatory requirements.
- The display must be earthed by a minimum 18 AWG, maximum 6 foot (1.8m) long wire connected to the ground connection at the rear.

TRANSIENT OVER-VOLTAGE

If the equipment is not used for a long time, disconnect it from the AC inlet to avoid damage by transient over-voltage.

To fully disengage the power to the unit, please disconnect the power cord from the AC inlet.

Power cords:

- Utilize a UL-listed detachable power cord, 3-wire, type SJ or equivalent, 18 AWG min., rated 300 V min., provided with a hospital-grade type plug 5-15P configuration for 120V application, or 6-15P for 240V application.

- Do not overload wall outlets and extension cords as this may result in fire or electric shock.
- Mains lead protection (U.S.: Power cord): Power cords should be routed so that they are not likely to be walked upon or pinched by items placed upon or against them, paying particular attention to cords at plugs and receptacles.

Water and moisture

The display is IPx1 compliant.

Note: The power supply is not approved for IPx2. The power supply must be mounted in a flat position for best resistance to fluids.

Ventilation

Heed the necessary free space around the display to allow enough air flow for cooling of the display.

Installation

Place the display on a flat, solid and stable surface that can support the weight of at least 3 displays. If you use an unstable cart or stand, the display may fall, causing serious injury to a child or adult, and serious damage to the equipment.

Do not allow to climb or rest on the display.

When adjusting the angle of the display, move it slowly so as to prevent the display from moving or slipping off from its stand.

When display is attached to an arm, do not use the display as a handle or grip in order to move the display. Please refer to the instruction manual of the arm for instructions on how to move the arm with the display.

Provide full attention to safety during installation, periodic maintenance and examination of this product.

Sufficient expertise is required for installing this product, especially to determine the strength of the wall for withstanding the display's weight. Be sure to entrust the attachment of this product to the wall to

licensed contractors of Barco and pay adequate attention to safety during the installation and usage.

Barco is not liable for any damage or injury caused by mishandling or improper installation.

More warnings in the Installation chapter.

This apparatus conforms to:

CE0120 (MDD 93/42/EEC class I product), IEC 60601-1, UL 60601-1, IEC 60601-1:2005, EN 60601-1-2:2006, ANSI/AAMI ES 60601-1-2005, CAN/CSA-C22.2 No. 60601-1-08, CAN/CSA C22.2 No. 601.01-M90 (c-UL), CCC GB4943-1995 (IEC 60950-1) (MDSC-1119 only).

National Scandinavian Deviations for Cl. 1.7.2 :

Finland: "Laite on liitettävä suojamaadoituskoskettimilla varustettuun pistorasiaan"
Norway: "Apparatet må tilkoples jordet stikkontakt"
Sweden: "Apparaten skall anslutas till jordat uttag"

EMC notice

No specific requirement on the use of external cables or other accessories except power supply.

With the installation of the device, use only the delivered power supply or a spare part provided by the legal manufacturer. Using another can result in a decrease of the immunity level of the device.

electromagnetic emissions

The MDSC-1119/MDSC-2124 is intended for use in the electromagnetic environment specified below.

The customer or the user of the MDSC-1119/MDSC-2124 should assure that it is used in such an environment.

Emissions test	Compliance	Electromagnetic environment – guidance
RF emissions CISPR 11	Group 1	The MDSC-1119/MDSC-2124 uses RF energy only for its internal function. Therefore, its RF emissions are very low and are not likely to cause any interference in nearby electronic equipment
RF emissions CISPR 11	Class B	The MDSC-1119/MDSC-2124 is suitable for use in all establishments, including domestic establishments and those directly connected to the public low-voltage power supply network that supplies buildings used for domestic purposes.
Harmonic emissions IEC 61000-3-2	Class D	
Voltage fluctuations/ flicker emissions IEC 61000-3-3	Complies	

This MDSC-1119/MDSC-2124 complies with appropriate medical EMC standards on emissions to, and interference from surrounding equipment. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Interference can be determined by turning the equipment off and on.

If this equipment does cause harmful interference to, or suffer from harmful interference of, surrounding equipment, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna or equipment.
- Increase the separation between the equipment and receiver.

- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced technician for help

electromagnetic immunity

The MDSC-1119/MDSC-2124 is intended for use in the electromagnetic environment specified below. The customer or the user of the MDSC-1119/MDSC-2124 should assure that it is used in such an environment.

Immunity test	IEC 60601 Test levels	Compliance level	Electromagnetic environment – guidance
Electrostatic discharge (ESD) IEC 61000-4-2	± 6kV contact ± 8kV air	± 6kV contact ± 8kV air	Floors should be wood, concrete or ceramic tile. If floors are covered with synthetic material, the relative humidity should be at least 30%
Electrical fast transient/burst IEC 61000-4-4	± 2kV for power supply lines ± 1kV for input/ output lines	± 2kV for power supply lines ± 1kV for input/ output lines	Mains power quality should be that of a typical commercial or hospital environment
Surge IEC61000-4-5	± 1 kV line(s) to line(s) ± 2 kV line(s) to earth	± 1 kV line(s) to line(s) ± 2 kV line(s) to earth	Mains power quality should be that of a typical commercial or hospital environment
Voltage dips, short interruptions and voltage variations on power supply input lines IEC 61000-4-11	< 5% U_T (> 95% dip in U_T) for 0.5 cycle 40% U_T (60% dip in U_T) for 5 cycles 70% U_T (30% dip in U_T) for 25 cycles < 5% U_T (>95% dip in U_T) for 5s	< 5% U_T (> 95% dip in U_T) for 0.5 cycle 40% U_T (60% dip in U_T) for 5 cycles 70% U_T (30% dip in U_T) for 25 cycles < 5% U_T (>95% dip in U_T) for 5s	Mains power quality should by that of a typical commercial or hospital environment. If the user of the MDSC-1119/MDSC-2124 requires continued operation during power mains interruptions, it is recommended that the MDSC-1119/MDSC-2124 be powered from an uninterruptible power supply or a battery.

U_T is the a.c. mains voltage prior to application of the test level

Immunity test	IEC 60601 test level	Level	Electromagnetic environment – guidance
Power frequency (50/60 Hz) magnetic field IEC 61000-4-8	3 A/m	Not applicable	Power frequency magnetic fields should be at levels characteristic of a typical location in a typical commercial or hospital environment.
Conducted RF IEC 61000-4-6 Radiated RF IEC 61000-4-3	3 Vrms 150 kHz to 80 MHz 3 V/m 80 MHz to 2.5 GHz	3 V 3 V/m	Portable and mobile RF communications equipment should be used no closer to any part of the MDSC-1119/MDSC-2124, including cables, than the recommended separation distance calculated from the equation applicable to the frequency of the transmitter. Recommended separation distance $d = 1.2\sqrt{P}$ $d = 1.2\sqrt{P}$ 80 MHz to 800 MHz $d = 2.3\sqrt{P}$ 800 MHz to 2.5 GHz Where P is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer and d is the recommended separation distance in meters (m). Field strengths from fixed RF transmitters, as determined by an electromagnetic site survey,[a] should be less than the compliance level in each frequency range.[b] Interference may occur in the vicinity of equipment marked with symbol:

[a] Field strengths from fixed transmitters, such as base stations for radio (cellular/cordless) telephones and land mobile radios, amateur radio, AM and FM radio broadcast and TV broadcast cannot be predicted theoretically with accuracy. To assess the electromagnetic environment due to fixed RF transmitters, an electromagnetic site survey should be considered. If the measured field strength in the location in which the MDSC-1119/MDSC-2124 is used exceeds the applicable RF compliance level above, the MDSC-1119/MDSC-2124 should be observed to verify normal operation. If abnormal performance is observed, additional measures may be necessary, such as re-orienting or relocating the MDSC-1119/MDSC-2124.

[b] Over the frequency range 150 kHz to 80 MHz, field strengths should be less than 3 V/m.

At 80 MHz and 800 MHz, the higher frequency range applies.

These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects and people.

Recommended separation distance

The MDSC-1119/MDSC-2124 is intended for use in an electromagnetic environment in which radiated RF disturbances are controlled. The customer of the user of the MDSC-1119/MDSC-2124 can help prevent electromagnetic interference by maintaining a minimum distance between portable and mobile RF communications equipment (transmitters) and the MDSC-1119/MDSC-2124 as recommended below,

according to the maximum output power of the communications equipment.

Rated maximum output power of transmitter W	Separation distance according to frequency of transmitter		
	150kHz to 80MHz $d = 1.2\sqrt{P}$	80MHz to 800MHz $d = 1.2\sqrt{P}$	800MHz to 2.5GHz $d = 2.3\sqrt{P}$
0.01	0.12	0.12	0.23
0.1	0.38	0.38	0.73
1	1.2	1.2	2.3
10	3.8	3.8	7.3
100	12	12	23

For transmitters rated at a maximum output power not listed above, the recommended separation distance d in meters (m) can be estimated using the equation applicable to the frequency of the transmitter. Where P is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer.

At 80MHz and 800MHz, the separation distance for the higher frequency range applies.

These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection form structures, object and people.

Recommendations for using your display system

Operating precautions: How to avoid image retention

Continuous operation of the display with the same image or static image elements may result in some image sticking on the LCD panel. This is especially a risk in applications where the display is connected to a computer.

In mission critical applications, do not activate a screen saver or power save mode. In other applications, especially when the display is connected to a computer, take the following precautions:

1. Switch on DPMS or Power Save on display and PC:
   - The display Power Save setting can be switched on in the display's **Settings** menu (see Online user manual).
   - The PC DPMS setting can be switched on in the Windows XP **Display** control panel (Screen Saver tab > Monitor power. In the 'Turn off monitor' drop-down box, select **After 20 mins**.).
2. Activate a good screen saver
   - The screen saver can be selected in the Windows XP **Display** control panel (Screen Saver tab). Select a screen saver without static elements and select a Wait Time of 10 minutes.
3. In case you are working with the same image or an application with static image elements for several hours continuously, change the image content regularly to avoid image sticking of the static elements.

Explanation of symbols

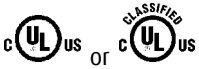
Symbols on the display and / or power supply

On the display or power supply, you may find the following symbols (nonrestrictive list):

Indicates compliance to the essential requirements of the Directive 93/42/EEC

Indicates compliance with Part 15 of the FCC rules (Class A or Class B)

Indicates the display is approved according to the UL regulations



Indicates the display is approved according to the c-UL regulations

Indicates the display is approved according to the DEMKO regulations

Indicates the display is approved according to the CCC regulations

Indicates the USB connectors on the display

Indicates the manufacturing date

Indicates the temperature limitations for the display to operate within specs

Indicates the display serial no.

Consult the operating instructions

Indicates this apparatus must not be thrown in the trash but must be recycled, according to the European WEEE (Waste Electrical and Electronic Equipment) directive

Symbols used throughout the manual:

Warning: Risk of injury to human beings

Caution: Risk of damage to the product

Important notice or remark

Note

Hint, tip

Additional information

Introduction

Thank you for choosing Barco.

Barco's MDSC-1119/MDSC-2124 is a versatile multi-modality display for endoscopic cameras, room and boom cameras, ultrasound, cardiology, PACS, anesthesiology and patient information. This gives surgeons the flexibility and information they need to perform surgeries with maximum efficiency.

Flexibility and expandability

The MDSC-1119/MDSC-2124's video bus architecture and modular slot concept allow the display to be configured to specific OR video connectivity requirements. Furthermore, Barco's surgical display readily supports new and future video formats, such as high-definition digital video.

Picture-in-Picture

Dual channel Picture-in-Picture or Picture-by-Picture views of images from multiple input signals give surgeons the required views, allowing them to make more informed decisions.

Customized profiles

Surgeons can configure, store and recall user preferences and profiles for each surgical procedure. This facilitates a streamlined, more comfortable way of working and allows to instantly deliver and restore optimally defined display settings at all times.

Note: Characters will look crisper and sharper than on a CRT display. This is inherent to the used flat panel technology. For the same reason, video images may appear somewhat blocked.

If you are not familiar with these image differences, you should familiarize yourself before using the display in a critical application and determine its usability.

Display parts, controls and connectors

Front

The front controls are soft touch keys.

When you touch any of them while no on-screen display (OSD) is on the screen, the front illumination is switched on for a few seconds.

When you touch a key again *while the illumination is on*, the function of the key is executed.

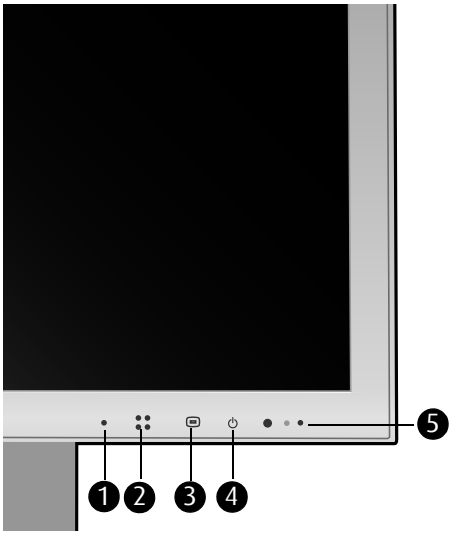


Figure 1: Front view

1. **Left navigation key**

   To move up in menus and decrease values in the OSD.

   When Quick Input Selection is enabled (see below), this key selects the previous input.

2. **Right navigation key**

   To move down in menus and increase values in the OSD.

When Quick Input Selection is enabled (see below), this key selects the next input.

3. **Enter**

   To display the OSD (on-screen display). In the OSD, this button acts as Enter button to make selections.

4. **Standby**

   To put the display in standby mode.

   To switch the display in stand-by, touch and hold this key until the display switches off. To turn the display on, touch and hold this key for about 2 seconds until the display switches on.

5. **Power LED**

   Indicates the display's power status.

   Green: Display is on (when enabled in the OSD).

   Orange: Display is in Standby power-saving mode.

   Off: Display is disconnected from the power or the LED's on state is disabled in the OSD.

Quick input selection

You can quickly select another video input as follows:

1. Make sure the OSD is not on the screen. If it is, exit the OSD.
2. Touch the navigation keys ⋅ or ⁘. The illumination is switched on and the current video input is displayed.
3. While the illumination is on, touch the navigation keys ⋅ or ⁘ to select another video input.

The quick input selection feature can be enabled/disabled in the Setup OSD menu.

Rear

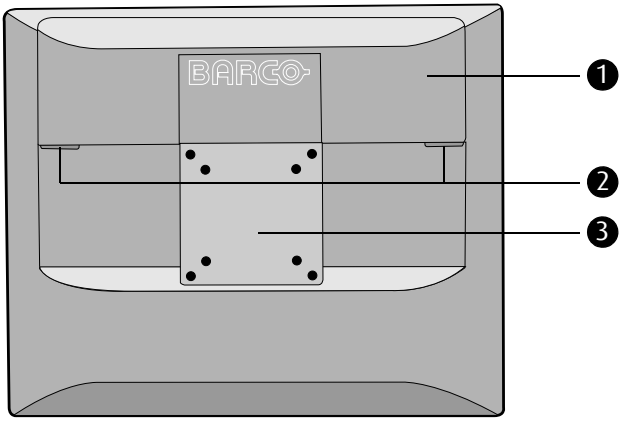


Figure 2: Rear view

1. Connector compartment cover.

   Remove to get access to the signal connectors.

2. Compartment cover levers to lock/unlock the cover.
3. VESA mount screw holes.

Connectors

The connector configuration may depend on the customer's requirements. Below is a description of the default connector configurations.

Standard connectors MDSC 1119

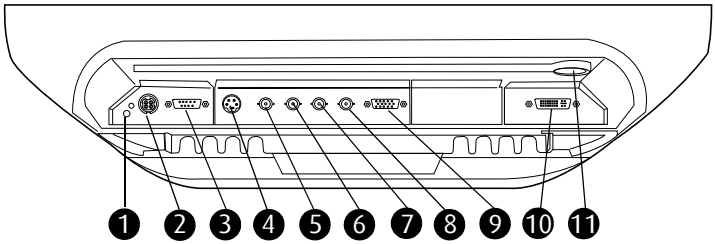


Figure 3: Connectors

1. General purpose input/output (GPIO) connector. Switches (max.2) connected to this plug can have different functions: Switch inputs or display a short text on the screen. This function can be selected in the on-screen menus.
2. +24VDC power input.

   Connect the output of the DC power supply delivered with the display to this connector.
3. RS-232 connector.
4. S-VHS video input.
5. SDI connector.
6. Input B / CVBS3 / Pb / C.
7. Input G / CVBS2 / Y / Y .
8. Input R / CVBS1 / Pr.
9. VGA input.
10. DVI-I input.
11. Slot for security cable (e.g., Kensington lock).

Selecting an input

Input selection can be done in 5 ways:

- Automatically, by means of the Source Scan system.
- By assigning a source priority.
- Quick input selection by using the general purpose switch.
- Quick input selection by using the navigation keys without entering the OSD.
- Using the Input selection menu in the OSD.

These 5 possibilities are described in detail in the Online User Manual on the product CD-ROM.

Standard connectors MDSC 2124

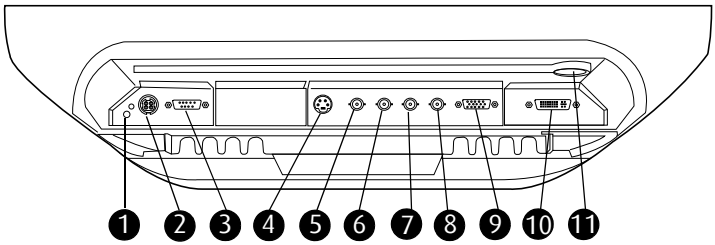


Figure 4: Connectors

1. General purpose input/output (GPIO) connector. Switches (max.2) connected to this plug can have different functions: Switch inputs or display a short text on the screen. This function can be selected in the on-screen menus.
2. +24VDC power input.

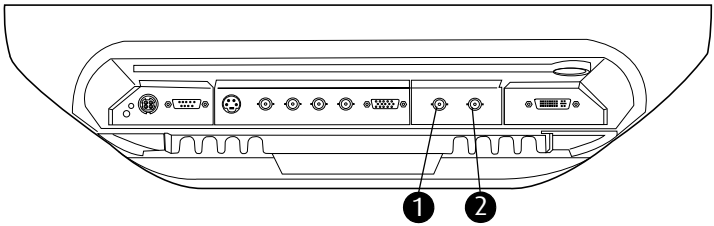
   Connect the output of the DC power supply delivered with the display to this connector.
3. RS-232 connector.
4. S-VHS video input.
5. SDI connector.
6. Input B / CVBS3 / Pb / C.

7. Input G / CVBS2 / Y / Y .
8. Input R / CVBS1 / Pr.
9. VGA input.
10. DVI-I input.
11. Slot for security cable (e.g., Kensington lock).

Optional inputs MDSC-1119

HD-SDI input

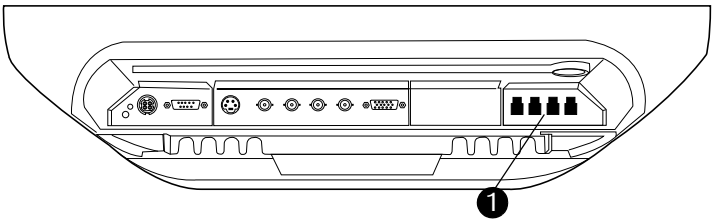
The display may be equipped with an optional HD-SDI (high-definition serial digital input) module. This input accepts HD-SDI and SD-SDI (standard-definition SDI) signals.



1. Video (HD-SDI or SD-SDI) input.
2. Video output. The signal on the input connector is buffered and presented here as output.

DVI Optical

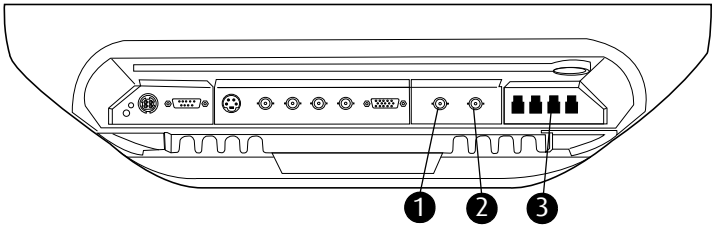
The display may be equipped with an optical DVI module. .



1. Optical DVI input.

DVI optical & HD-SDI input

The display may be equipped with an optional HD-SDI (high-definition serial digital input) module and an optical DVI module.

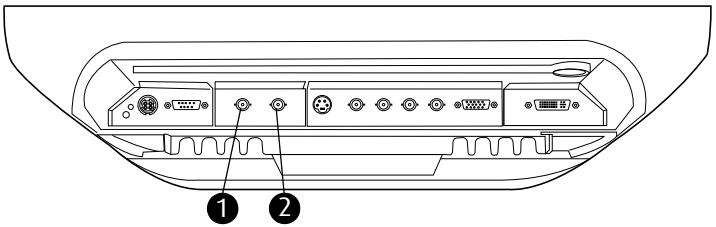


1. Video (HD-SDI or SD-SDI) input.
2. Video output. The signal on the input connector is buffered and presented here as output.
3. Optical DVI input.

Optional inputs MDSC-2124

HD-SDI input

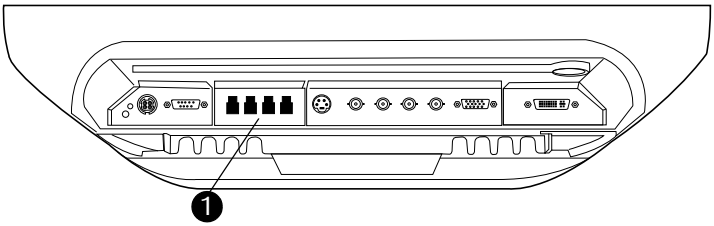
The display may be equipped with an optional HD-SDI (high-definition serial digital input) module. This input accepts HD-SDI and SD-SDI (standard-definition SDI) signals.



1. Video (HD-SDI or SD-SDI) input.
2. Video output. The signal on the input connector is buffered and presented here as output.

DVI Optical

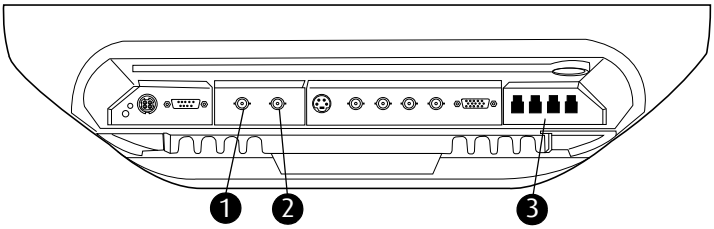
The display may be equipped with an optical DVI module. .



1. Optical DVI input.

DVI optical & HD-SDI input

The display may be equipped with an optional HD-SDI (high-definition serial digital input) module and an optical DVI module.



1. Video (HD-SDI or SD-SDI) input.
2. Video output. The signal on the input connector is buffered and presented here as output.
3. Optical DVI input.

Display installation

Installation precautions

Precautions

- Keep your original packaging. It is designed for this display and is the ideal protection during transport.
- Avoid reflections in the flat panel to reduce eye strain.
- Make sure the surface, stand, arm or boom to bear the display is strong and stable enough to bear its weight.
- Keep the display away from heat sources and provide enough ventilation around the display.
- Do not use the display in direct sunlight.
- To avoid permanent damage, do not scratch or apply pressure to the LCD panel or front filter if present.

Vesa-mount installation

The display supports arm stands according to the VESA 100 mm and 75 mm standards.

Important:

- Use an arm that is approved by VESA.
- Use an arm that can support a weight of at least 10 kg (22.05 lbs).

To attach the panel unit to an arm stand:

- Attach the arm stand **firmly** to the panel using the included 4 hexagonal screws (M4 x 10 mm) and the dented washers. Use the included 2.5 mm Allen key to fix the screws.

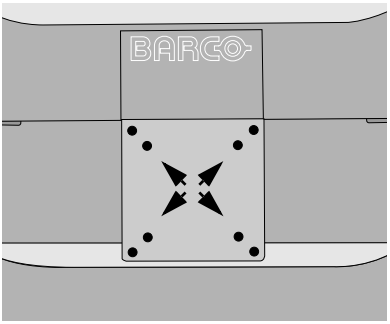


Figure 5: Vesa mount fixation holes

Connecting the signal cables

To connect the signal cables to the display:

1. If present, turn off the computer or video source.
2. Slide down the connector compartment cover levers (1) to unlock the cover (2).

Important: Do not put too much force on the levers as they might break.

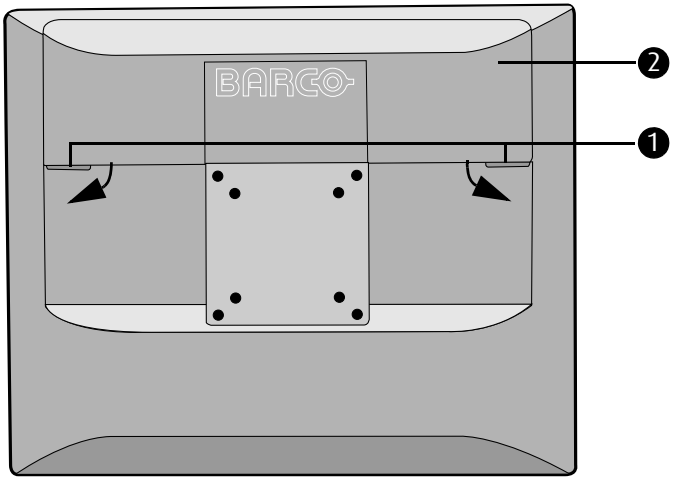


Figure 6: Connector compartment cover

3. Remove the connector compartment cover.
4. For easy removal of the compartment cover, use pencil in order to rotate the two clips on the bottom side of the cover at the location as shown in picture above.
5. Verify that the clips are in a horizontal position so the compartment cover is fully locked during usage.
6. Connect the available video source(s) to the corresponding video inputs using an appropriate video cable.
7. Connect the external DC power supply delivered with the display to the display's DC power input (3).

   Connect the other end of the external DC power supply to a **grounded** power outlet by means of the proper power cord delivered in the packaging (4).

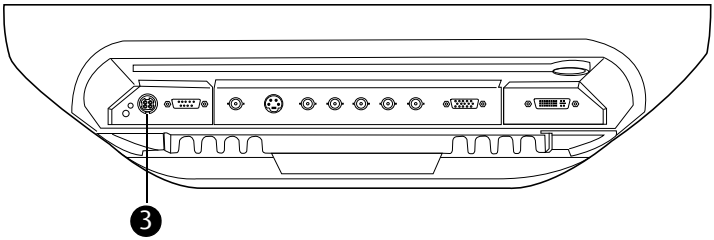


Figure 7: Connectors

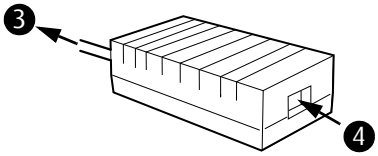


Figure 8: External DC power supply

8. Bind the cables in the connector compartment together with the Velcro strips and cable ties delivered with the display.
9. Switch on all devices.

For more information about how to control and adjust the display, please consult the Online User Manual.

Cleaning instructions

Precautions

Precautions

- Before cleaning, switch the display in stand-by position to prevent the control touch keys from being activated inadvertently by sweeping over the front filter. In stand-by position the touch keys cannot be activated by just sweeping over them. To switch the display on again, you must press the stand-by touch key for a few seconds.
- Take care not to damage or scratch the front filter or LCD panel. Be careful with rings or other jewelry that can touch the front filter.
- Do not apply pressure on the front filter or LCD panel.
- Do not apply or spray liquid directly to the front filter, panel or cabinet as excess liquid may cause damage to internal electronics. Instead, apply the liquid to the cleaning cloth.
- Follow your hospital protocol for the handling of blood and body fluids.
- The display is not disinfected or packed in sterile environment. Follow your hospital protocol in case the display needs to be disinfected prior to intallation.
- Follow your hospital protocol for the handling of blood and body fluids.

Front filter

Proceed as follows:

1. Remove dust with a dry, lint-free, non-abrasive soft cotton cloth.

2. Remove fingerprints or grease using a lint-free, non-abrasive soft cotton cloth that is **lightly** moistened with plain water or a mild commercial glass cleaning product suited for coated glass surfaces.

   The following products are tested and approved:

   - Misty Clear Lemon 10 Disinfectant
   - Bohle glass cleaner
   - Zep Heavy-duty glass & all surface cleaner
   - Klear Screen
   - Screen TFT (Kontakt Chemie)
   - Incidin Foam (Ecolab)
   - Microzid
   - Mild detergent
   - Isopropyl alchohol with concentration < 5%
   - Household bleach (generic sodium hypochlorite, solutions of 5.25% sodium hypochlorite diluted with water between 1:10 and 1:100)

3. Gently wipe dry with a dry cloth.

Do NOT use:

- Alcohol/solvents at higher concentration > 5%
- Strong alkalis lye, strong solvents
- Acid
- Detergents with fluoride
- Detergents with ammonia
- Detergents with abrasives
- Steel wool
- Sponge with abrasives
- Steel blades
- Cloth with steel thread

Cabinet

Proceed as follows:

- Clean the cabinet using a soft cotton cloth, lightly moistened with a recognized cleaning product for medical equipment.
- Repeat with water only.
- Wipe dry with a dry cloth.
- The cabinet has been tested for resistance to the following products:
    - Virex Ready-to-use Disinfectant Cleaner
    - Misty Clear Lemon 10 Disinfectant
    - Misty Multi-Purpose Disinfectant Cleaner
    - Misty Multi-Purpose Disinfectant Cleaner II
    - Bohle glass cleaner
    - Zep Heavy-duty glass & all surface cleaner
    - Klear Screen
    - Screen TFT (Kontakt Chemie)
    - Incidin Foam (Ecolab)
    - Microzid
    - Mild detergent
    - Isopropyl alchohol with concentration < 5%
    - Household bleach (generic sodium hypochlorite, solutions of 5.25% sodium hypochlorite diluted with water between 1:10 and 1:100)
    - Precise Hospital Foam Cleaner Disinfectant

Technical information

Connector pin assignments

D-Sub 15 connector (analog video):

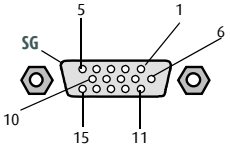


Figure 9: D-Sub 15 pin layout

Pin no.	Signal	Pin no.	Signal
1	Red in	9	DDC 5V IN
2	Green in	10	VGA PRES
3	Blue in	11	NC
4	NC	12	DDC SDA
5	GND	13	HS IN
6	GND	14	VS IN
7	GND	15	DDC SCL
8	GND	SG	Shielded Ground

DVI connector:

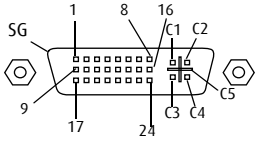


Figure 10: DVI-I connector pin layout

Pin no.	Signal	Pin no.	Signal
1	TMDS DATA 2-	16	HOT PLUG DETECT
2	TMDS DATA 2+	17	TMDS DATA 0-
3	GND	18	TMDS DATA 0+
4	NC	19	GND
5	NC	20	NC
6	DDC CLOCK	21	NC
7	DDC DATA	22	GND
8	Analog VS	23	TMDS CLOCK+
9	TMDS DATA 1-	24	TMDS CLOCK-
10	TMDS DATA 1+	C1	Analog R
11	GND	C2	Analog G
12	NC	C3	Analog B
13	NC	C4	Analog HS
14	+5V POWER	C5	Analog Ground
15	GND	SG	Shielded Ground

D-Sub 9 female (RS-232) connector:

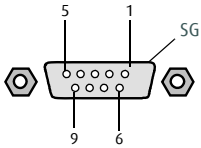


Figure 11: D-Sub 9 pin layout

Pin no.	Signal
1	Not used
2	Transmit data (TXD)
3	Receive data (RXD)
4	Not used
5	GND
6	Not used
7	Not used
8	Not used
9	Not used
SG	Shielded Ground

S-Video connector:

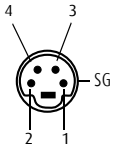


Figure 12: 4-pin mini DIN pin layout

Pin no.	Signal
1	Ground (Y)
2	Ground (C)
3	Luminance (Y)
4	Chroma (C)
SG	Shielded Ground

Power cable recommendations

When using long power cables, the DC voltage at the power input of the display might be too low for the display to operate safely.

Therefore, we recommend the following maximum power cord lengths:

Cable type	Resistance/ wire [Ohm/km] *	# wires parrallel	Effect Resistance [Ohm/km]	MDSC-1119 max. cable length	MDSC-2124 max. cable length
2x1,5mm²	14.87	1	14.87	78	13
4x0,75mm²	29.07	2	14.54	79	13
4x1mm²	21.80	2	10.90	106	17
6x0,75mm²	29.07	3	9.69	119	19
4x1,5mm²	14.87	2	7.44	155	25
6x1mm²	21.80	3	7.27	159	26
6x1,5mm²	14.87	3	4.96	233	38

* resistance at 50 °C

Note:

	MDSC-1119	MDSC-2124
Min Input voltage [V]	18	22
Current[A]	2.6	4
Max allowable voltage drop[V]	6	1.5

Technical specifications

MDSC-1119:

Item	Specification
Resolution	Native: 1280x1024
Display area (H x V)	433.2 x 324.9 (mm)
Viewing angle (@ 10/1 contrast)	Vertical: 178º Horizontal: 178º
Pixel Pitch	0.294 mm (H) x 0.294 mm (V)
Native color resolution	8 bits / sub-pixel
Luminance	220-270 cd/m²
Contrast ratio	700/1 (typical in dark environment)
Response time (tf+tr)	18 ms typical (@ 25° C after 30 min warm-up)
Digital video input specifications	Complying to DVI Rev 1.0 specifications
DVI-I analog video signal level	500-950 mV
DB15 analog video signal level	500-950 mV
BNC analog video signal level	500-950 mV
Component video signal level	Y: 1000 mV u, v: 700 mV
S-Video signal level	Y: 1000 mV C: 286 mV
Composite video signal levels	1000 mV

Item	Specification
Input signals	Possible resolutions: • • 640 x 480 @ 60, 75, 85, 100 Hz • • 800 x 600 @ 60, 75, 85, 100 Hz • 1024 x 768 @ 60, 75, 85, 100 Hz • 1024 x 1280 @ 59 Hz • 1024 x 1280 @ 70 Hz • 1152 x 864 @ 75 Hz • 1152 x 870 @ 60, 85, 100 Hz • 1280 x 1024 @ 60, 75, 85 Hz
Power source	Input for external power supply unit: 90 ~ 264 VAC Input for display: 24 VDC. (The supplied power supply must be used)
Power consumption	80 Watt (max., at 90 VAC, maximum back-light)
Dimensions unpacked (W x H x D)	428.9 x 354.6 x 78.5 mm (without foot)
Dimensions packed	535 x 185 x 590 mm
Net weight (unpacked, without foot)	8.6 kg
Operating Tempera-ture	0°C to 40°C, 15°C to 35°C within specs
Storage Temperature	-20°C to 60°C
Humidity	20% - 85% (non-condensing) for operation 20% - 85% (non-condensing) for storage
Altitude	7500 m storage 3000 m operation

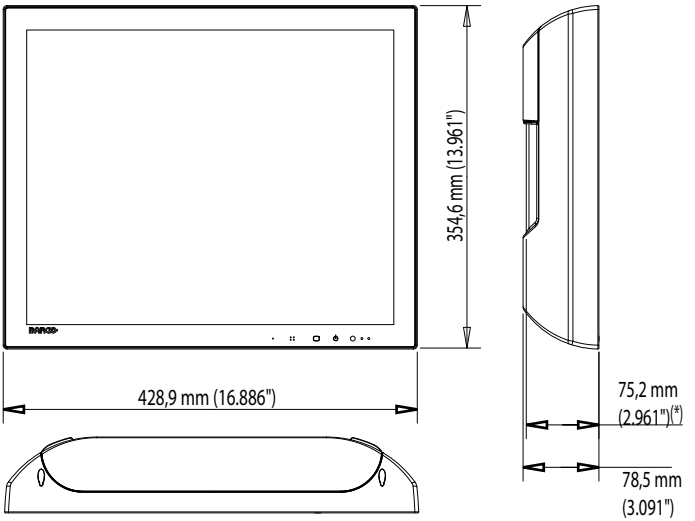
MDSC-2124:

Item	Specification
Resolution	Native: 1920x1200
Display area (H x V)	518.4 x 324 (mm)
Viewing angle (@ 10/1 contrast)	Vertical: 178° Horizontal: 178°
Pixel Pitch	0.270 mm (H) x 0.270 mm (V)
Native color resolution	8 bits / sub-pixel
Luminance	320-400 cd/m²
Contrast ratio	700/1 (typical in dark environment)
Response time (tf+tr)	5 ms typical (@ 25° C after 30 min warm-up)
Digital video input specifications	Complying to DVI Rev 1.0 specifications
DVI-I analog video signal level	500-950 mV
DB15 analog video signal level	500-950 mV
BNC analog video signal level	500-950 mV
Component video signal level	Y: 1000 mV u, v: 700 mV
S-Video signal level	Y: 1000 mV C: 286 mV
Composite video signal levels	1000 mV

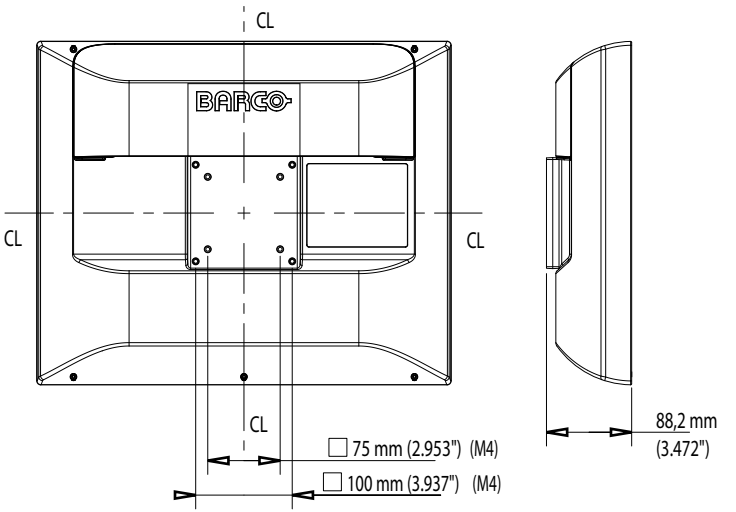
Item	Specification
Input signals	Possible resolutions: • • 640 x 480 @ 60, 75, 85, 100 Hz • • 800 x 600 @ 60, 75, 85, 100 Hz • 1024 x 768 @ 60, 75, 85, 100 Hz • 1024 x 1280 @ 59 Hz • 1024 x 1280 @ 70 Hz • 1152 x 864 @ 75 Hz • 1152 x 870 @ 60, 85, 100 Hz • 1280 x 1024 @ 60, 75, 85 Hz • 1600 x 1200 @ 59 Hz • 1200 x 1600 @ 59 Hz • 1920 x 1200 @ 60 Hz
Power source	Input for external power supply unit: 90 ~ 264 VAC Input for display: 24 VDC. (The supplied power supply must be used)
Power consumption	130 Watt (max., at 90 VAC, maximum back-light)
Dimensions unpacked (W x H x D)	784 x 199 x 543 mm (without foot)
Dimensions packed	878 x 277 x 569 mm
Net weight (unpacked, without foot)	10,8 kg
Operating Tempera-ture	0°C to 40°C, 15°C to 35°C within specs
Storage Temperature	-20°C to 60°C
Humidity	20% - 85% (non-condensing) for operation 20% - 85% (non-condensing) for storage

Item	Specification
Altitude	7500 m storage 3000 m operation

Dimensions MDSC-1119:

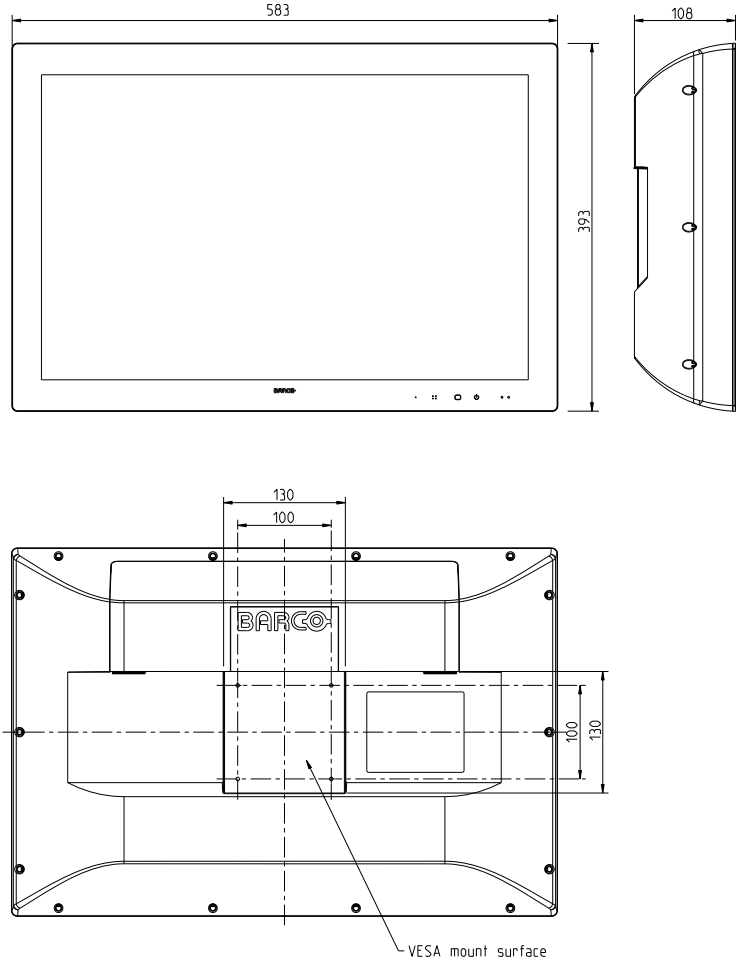


(*) Option: Insulation plate for VESA mount (No galvanic contact between display and mounting plate)



Maximum mounting plate dimensions:
114mm x 114mm (4.488"x4.488")

Dimensions MDSC-2124:



BARCO MID GENERAL WARRANTY TERMS AND CONDITIONS

Applicable from Jan 1st 2008

ARTICLE 1: PRODUCT WARRANTY

Barco nv, Medical Imaging Division warrants that the equipment will be free of defects in workmanship or material for the warranty period or the specific period of a warranty extension program.

Hardware: Barco warrants that upon delivery hereunder the Products shall (i) conform to its specifications in effect at the date of delivery and (ii) be free from defects in material and workmanship (the "Warranties").

Software: Barco warrants that software written by Barco shall perform substantially in accordance with the specifications in effect at the date of delivery. Software is inherently susceptible to bugs and errors. Barco makes no warranties with respect to the software which is provided to Customer on an "as-is" basis and does not warrant uninterrupted or error-free operation of the Products.

Unless otherwise indicated in Barco's Product manual or in the agreement between Barco and Customer, the Warranty Period shall be

(a) Hardware: 12 months commencing on the Barco date of invoice.

(b) Software: 3 months commencing on the Barco date of invoice.

Notwithstanding the provisions of clause 2, repair and replacement of defects in material and/or workmanship under this warranty shall be accomplished in our works according to the terms and conditions as set forth hereafter:

1.1

Any claim under the Warranties must be notified to Barco in writing within 8 days from the date the defect or failure has been discovered or noticed the first time. The Customer, upon the occurrence of any equipment failure, shall contact Barco nv, MID customer support centre (or an authorised service centre) by telephone, fax or e-mail and shall provide the applicable customer support person with a complete description of the problem being encountered, including the model and serial number of the equipment in which the problem has arisen.

1.2

The customer support person shall diagnose the problem experienced by the Customer and shall advise the Customer on how to proceed. Customer support may ask to return the faulty equipment or faulty subassemblies to the Barco nv, or a MID customer support centre (or an authorised service centre) for repair activities. In no event shall Customer return a defective Product or part thereof to Barco without Barco's prior written approval.

In the event the return to Barco of the defective Product is authorized by Barco, Barco shall issue to Customer an RMA (Return Material Authorization).

The Customer shall apply for an RMA number to the closest Barco nv, MID Customer support centre (or an authorised service centre) as listed at www.barcomedical.com, unless otherwise indicated.

The one-way cost of packing, transport and insurance related to shipping the alleged defective Product or part to Barco for repair or replacement shall be borne by Customer. The one-way cost of packing, transport and insurance related to shipping of the repaired or replacement Product or part to Customer shall be borne by Barco.

1.3

The Customer shall return, freight prepaid, the defective equipment or subassemblies in its original packaging with the assigned RMA number for repair to the Barco nv, MID Customer support centre (or an authorised service centre).

1.4

Replacement parts used shall be new or equivalent to new parts for the revision level of the equipment. A replacement LCD panel will be new or similar run time. The warranty period for the replacement parts will expire at the same moment as the original warranty period of the equipment. All parts replaced hereunder and returned to Barco nv, MID (or an authorised service centre) shall become the property of Barco nv, MID (or the authorised service centre).

1.5

The repaired equipment shall be returned to the Customer, by regular freight, at Barco nv, MID's charge.

1.6

Barco nv, MID will replace a product that fails within 90 days after shipment from Barco with a new one, ensuring color matching in the event of a diagnostic multi head display configuration.

Barco aims to ship the new replacement product within 2 business days after receipt of the Customers notification in writing.

ARTICLE 2: CONDITIONS PRECEDENT FOR WARRANTY AND ITEMS EXCLUDED FROM WARRANTY

A. The Warranties shall apply only to the extent the Products or any parts thereof have

(i) been transported and stored at all times in the original packaging in the conditions as specified by Barco (such as covered and secure location, minimum and

maximum temperature, maximum humidity, ...) or, in absence thereof, at least in conditions consistent with generally accepted practice for this type of products;

(ii) been handled at all times in accordance with Barco's instructions or, in absence thereof, at least with the care and caution consistent with generally accepted practice for this type of products;

(iii) been installed strictly in accordance with the instructions and directions given by Barco (if and to the extent the Products have not been installed by Barco or its authorized subcontractors);

(iv) not been subject to any unauthorized access, alteration, modification or repair or attempts thereto;

(v) been at all times "normally used" for the intended purpose and operated in strict accordance with the operating instructions set forth in the operating manual of the Product in question and shall not have been otherwise misused, abused, damaged. For the purpose hereof, "normally used" shall mean a regular, ordinary and routine usage of the Product in question as intended and/or recommended by Barco;

(vi) been maintained at all times in accordance with Barco's instructions or, in absence thereof, at least with intervals and in a manner consistent with generally accepted practice for this type of products;

B. The warranty described herein shall not include the following:

2.1

Any hardware or software item procured from a source other than Barco nv, MID or their official agent or distributor and integrated by Customer or a third party into Barco nv, MID supplied equipment.

2.2

Any host configuration not explicitly supported by Barco nv, MID.

2.3

All software installed on the system, whether they are acquired from Barco nv, MID or third party. An exception is made for software delivered by Barco nv, MID that would prove to be a cause for the mal functioning of the hardware covered under this Agreement.

2.4

Normal wear and tear, use under circumstances exceeding specifications, such as use in dusty environment or under excessive temperature conditions, abuse,

unauthorised repair or alternation, lack of proper configuration or maintenance, damaged or modified or removed serial number, cosmetic refurbishment.

2.5

Repair or replacement of consumables[1] or specific parts that by definition are subject to wear and tear, including but not limited to:

a.CRT's, LCD panels

b.Backlights in diagnostic LCD displays, when the backlight run time[2] is beyond the Guaranteed Backlight Lifetime[3] of that model, when used at the Factory Calibrated Luminance[4]

Eg1.

- A display is used at 8 hours/day; ie. +/-2.920hours/year
- The display system is covered with a warranty period of 5 year
- The Guaranteed Backlight Lifetime of that model is 17.000hours.
- The Factory Calibrated Luminance cannot be achieved anymore after 4 year, thus corresponding to +/-11.680hours
- Result: the backlight replacement is performed under warranty

Eg2.

- A display is used at 24 hours/day; ie. 8.760hours/year
- The display system is covered with a warranty program of 5 year
- The Guaranteed Backlight Lifetime of that model is 17.000hours.
- The Factory Calibrated Luminance cannot be achieved anymore after 2.5years, thus corresponding to +/-21.900hours
- Result: the backlight replacement does not make part of the warranty coverage.

(1): 'Consumable' is a part that can be replaced by the user

(2): 'Backlight run time' is the total time that an image (including use of a screen saver) has been applied to the screen; this value can be consulted via the OSD buttons (On Screen Display).

(3): 'Guaranteed Backlight Lifetime' is the number of backlight hours during which a predefined luminance value, ie. the Factory Calibrated Luminance, will be provided by a specific diagnostic display model. This figure is printed on the Warranty certificate of each display or can be requested at your local Barco office.

(4): 'Factory Calibrated Luminance': is the typical luminance value that a specific diagnostic display model is calibrated at during the production process. This figure is printed on the Warranty certificate of each display or can be requested at your local Barco office.

c. Lamps, optical components in projectors

d. Replacement because of:

i. image retention as a result of:

- not correctly using screen saver and/or Display Power Management System (DPMS) as explained in the user manual
- prolonged operation of the display with a static image on the same screen area

ii. a number of missing pixels that is lower than the total allowable number as mentioned in the product specifications.

iii. difference in color temperature that is lower than the total allowable difference as mentioned in the product specifications

iv. difference in color temperature as a result of not using all displays of a multi-head configuration at the same rate.

v. LCD luminance uniformity that is in within the product specifications or luminance uniformity performance that is inherent to LCD technology.

Barco nv, MID does not warrant a minimum life time nor a performance of any of the consumables.

2.6

Replacement of moveable parts such as power cords, remote controls, ...

2.7

Any product disassembly and installation costs at the operation site, travel expenses and travel time to and from the operation site for the personnel in charge of the repair works and transport charges.

2.8

Any failures resulting from an accident, negligence (such as but not limited to removing or deleting system files & licensed software product files), misuse, circuit failure or any change, damage due to fire, water, thunder or lightning, power failure or fluctuation, disruption of communication lines or due to force majeure, or any reason foreign to the equipment.

2.9

Any specific services or procedures, asked for by Customer, related to verification of repaired equipment.

2.10 The evaluation cost in case of a returned product deemed functional is not covered under warranty and will be charged to the Customer, at Barco's sole discretion, based on a case-by-case evaluation.

ARTICLE 3: OBLIGATIONS OF THE CUSTOMER

Customer hereby assumes the following obligations as partial consideration for Barco nv, MID performance of its requirements under the warranty condition; failure by Customer to meet its obligations under this paragraph shall excuse Barco nv, MID's performance hereunder:

3.1

Customer shall not expose Barco nv, MID personnel to any unsafe working conditions.

3.2

Repairs to equipment under warranty resulting from improper maintenance or repair performed by the Customer, or its officers, agents, employees, or representatives,

shall be borne by the Customer at its additional cost and expense.

3.3

The Customer is responsible for installing the Barco nv, MID equipment in an environment for which it was intended. If there is an indication that the equipment was used – even temporary – outside its specifications, Barco nv, MID is entitled not to perform warranty repairs and terminate the warranty agreement. Any actions that have been taken by Barco nv, MID in this respect, may be invoiced to the Customer at normal pricing.

ARTICLE 4: REMEDIES UNDER WARRANTY

(a) Hardware: If during the Warranty Period a Product or any part thereof, fails to meet any of the Warranties then, upon Customer's request, Barco shall, at its sole option and cost, promptly and within 20 working days, either: (i) repair or correct the Product or part in question; or (ii) replace the Product or supply part(s) or component(s) according to the terms and conditions contained in article 1. A replacement part shall be at least functionally equivalent to the original part. The replaced Product, parts and/or components shall become the property of Barco and shall, at Barco's request, be returned by Customer to Barco at Barco's cost.

(b) Software: Barco's sole obligation shall be to rectify substantial malfunctions of the software (to the extent technically reasonably possible) by amending the software or supplying an alternative version of the software.

(c) The repair or replacement under the Warranties covers the cost of material and labor.

ARTICLE 5: DISCLAIMER OF WARRANTIES

BARCO NV, MID DISCLAIMS ALL WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING ALL IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

ARTICLE 6: LIMITATION OF LIABILITY

The remedies specified in these Terms and Conditions shall constitute Customer's sole and exclusive remedy and Barco's sole and exclusive liability for Barco’s breach of the Warranties hereunder.

BARCO NV, MID SHALL NOT UNDER ANY CIRCUMSTANCES BE LIABLE TO CUSTOMER OR ANY THIRD PARTY FOR DIRECT, INDIRECT, INCIDENTAL, SPECIAL OR CONSEQUENTIAL DAMAGES, SUCH AS BUT NOT LIMITED TO, DAMAGE TO OR LOSS OF TANGIBLE OR INTANGIBLE PROPERTY OR EQUIPMENT, LOSS OF PROFITS OR REVENUES, COST OF CAPITAL, COST OF PURCHASE OF REPLACEMENT GOODS, OR CLAIMS OF USER FOR SERVICE INTERRUPTIONS. THE LIABILITY OF BARCO NV, MID FOR MANUFACTURING, SALE, DELIVERY, RESALE, INSTALLATION, OPERATION OR SUITABILITY FOR USE OF ANY PRODUCTS OR SERVICES COVERED BY OR FURNISHED UNDER THIS WARRANTY CONDITION, WHETHER ARISING OUT OF CONTRACT, NEGLIGENCE, STRICT TORT, WARRANTY OR OTHERWISE, SHALL NOT EXCEED THE PRICE OF THE ITEM OR ITEMS OF

GOODS OR SERVICES UPON WHICH SUCH LIABILITY IS BASED.

ARTICLE 7: FORCE MAJEURE

Either party shall be released from performance of its obligations under this agreement to the extent, and for so long as, the performance of this agreement is impeded by reason of force majeure. For the purposes of this clause the expression "force majeure" means, but shall not be limited to, industrial dispute, fire, mobilisation, requisition, embargo, currency transfer prohibitions, insurrection, lack of means of transport, restrictions of the use of energy, and generally any circumstances which are beyond the control of the parties and hinder performance by one party of his obligations.

ARTICLE 8: GENERAL

8.1

Customer acknowledges its understanding that all software and electronic devices, including Barco nv, MID products are subject to possible error, mechanical or electrical failure, and should not be relied upon in inappropriate applications or without proper backup and/or other safety precautions whenever personal injury or property damage may result from failure or error of the product.

8.2

Barco nv, MID shall not be responsible for machine failure and/or its failure to render service or maintenance due to causes beyond its reasonable control.

CE

K5904073-06

March 2013

Barco n.v.
President Kennedypark 35
8500 Kortrijk
Belgium

www.barco.com